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EDITORIAL.—Never have our friends come forward more readily to the support of the GAZETTE than in the beginning of this fifth volume. More subscriptions have been received than ever before in the same time. Many letters have come expressing surprise that such a publication as the GAZETTE existed, for the writers had never heard of it. Now this kind of knowledge will have to be spread by botanical friends, as it would be impossible to have the GAZETTE advertised in such a way as to come to the knowledge of every botanist. If our friends, in their correspondence, will mention the GAZETTE and recommend, at least, applying for a sample copy, many persons will be reached who will be glad to become subscribers. The GAZETTE can pay for itself now, but some such effort to increase our subscription list will enable us to pay for plates, by which we can secure some exceedingly valuable articles. That our friends may know in what estimation the GAZETTE is held by our leading botanists and thus feel a confidence in recommending it to any of their friends, we make the following quotation from the American Journal of Science and Arts for February: "It (the GAZETTE) is an organ for communication among botanists, for the prompt publication of notes and observations, and of those contributions to knowledge which every accurate observer may do his part in, but which must be collected in order to be preserved and utilized. New species are published or announced in it, but it is rather an organ for new observations and botanical news. It is well conducted; it is very useful; we learn that it is in a condition which insures its continuance, and that every increase in the subscription will go towards increasing its value. Our botanists should now see that it is worthily supported. Indeed they can hardly do without it."

THE GENUS LEAVENWORTHIA has been almost from the first involved in some difficulty as to the species. Having now some new material, I wish to bring the present state of the case before the botanists of the Trans-Alleghanian States it inhabits in order to obtain from them further collections and observations in the course of the ensuing spring and early summer. With such aid I may then hope to determine the number and distinctions of the species.

Two species were originally established by Dr. Torrey; *L. aurea*, with distinct style and embryo nearly straight, and *L. Michauxii*, with style almost wanting and radicle oblique. The corolla of the first was said to be yellow, upon the authority of the original collector, Dr. Leavenworth. Indeed one of his specimens in the Shortian herbarium is ticketed "flowers yellow"; the other "flowers golden yellow." Both are from the Irish Bayou settlement [N. E.] Texas," and though Dr. Leavenworth thought they might be distinct species, they differ only in that one has all the peduncles radical and one-flowered, while the other is subcaulescent with central peduncle few-flowered. The petals show no trace of the yellow color, but rather seem to have been white with a purplish tinge.

Of the second species, described from Dr. Short's Kentuckian specimens, Dr. Torrey could only say that the flowers in his opinion were pale yellow. Dr. Short does not record their color, either in the specimens he sent to Dr. Torrey or in his own herbarium. But all the specimens received of *L. Michauxii*, that is all with an even and rather broad silique and a very short or almost obsolete style, have white or purplish tinged petals with at most a yellow base. But the same is true of all the specimens (of which the color is noted) received from Alabama, Tennessee, etc., which, having their oblong-linear or lanceolate pods surmounted by a distinct and rather slender style, were taken for *L. aurea;* also in plants raised here from the seeds in different years. At most the base or claw of the petals was yellow, the lamina white varying to purple. Accordingly, in the Manual, neglecting the style, and the embryo, I referred all these to *L. Michauxii*, and reduced *L. aurea* to a synonym or a yellow-flowered form of it.

But now, with all the available material before me, including a peculiar yellow-flowered form recently detected in Tennessee by Dr. Gattinger, I am disposed to recognize four forms as probable species, and I will here note their distinctions, making at the same time an appeal for further information before coming to a full conclusion. The forms or species before me are as follows:

1. L. MICHAUXII, Torr. Silique oblong-linear, not torulose; style very short or none; seeds orbicular and rather broadly winged; radicle very oblique, approximated on one side to the edges of the cotyledons; petals white with purplish tinge and a yellowish claw.—(Tennessee, on rocks at Knoxville, *Michaux*, if this is indeed *Cardamine uniflora*, Michx., but I have noted that his specimens have a distinct but short style.) Barrens of Kentucky, *Short.* Charlestown, Indiana, *J. M. Coulter.*

2. L. AUREA, Torr. Silique oblong-linear or narrower, not torulose; style conspicuous, commonly as long as the breadth of the silique; seeds of the preceding; but the radicle merely oblique, sometimes slightly so; petals of the preceding or yellow!—Arkansas and N. E. Texas, *Leavenworth*, with flowers said to be yellow. Alabama, *Buckley*, *Hatch*, *Peters*, etc., with petals purple, pale rose, or white, with yellowish base, sometimes fully half inch long.

L. TORULOSA. Silique linear, conspicuously torose; style fully equalling the breadth of the silique; seeds broadly oval, narrowly winged; radicle nearly transverse, strictly applied to the edges of the cotyledons at the base on one side; petals purplish with a yellow base.—Barrens of Kentucky, *Short.* Very abundant near Nashville, Tennessee, *Dr. Gattinger.*

L. STYLOSA. Slender, strictly stemless; silique or rather silicle oval or broadly oblong (about 4 lines long and fully two inches wide), plane, surmounted by a slender style of fully 2 lines in length; seeds only 3 to 6, orbicular, distinctly winged; embryo as in the preceding; petals pure golden yellow.—Cedar barrens, Lavergne, near Nashville, Tennessee, *Dr. Gattinger*, June 2, 1879.

Fresh specimens and notes are solicited by ASA GRAY.

AUTOMATIC MOVEMENT OF THE FROND OF ASPLENIUM TRICHOMANES.—Mr. E. J. Loomis, of the Nautical Almanac office, Washington, recently showed me a phenomenon which I suppose has never before been noticed, and which is commended to the attention of botanists. A tuft of *Asplenium Trichomanes*, gathered last autumn in the mountains of Virginia, is growing in his house, in a glass dish. About two months ago he noticed that one of the fronds—a rather short and erect one which is now showing fructification—made quick movements alternately back and forth, in the plane of the frond, through from 20 to 40 degrees, whenever the vessel was brought from its shaded situation into sunlight or bright daylight. The movement was more extensive and rapid when the frond was younger. When I saw it on the 23d of January, its compass was within 15 degrees, and was about as rapid as that of leaflets of *Desmodium gyrans*. It was more rapid than the second hand of a watch, but with occasional stops in the course of each half vibration. This was in full daylight next a window, but not in sunshine. No movement had been observed in the other fronds, which were all sterile and reclining. with the exception of a single one which was just unfolding, in which Mr. Loomis thinks he has detected incipient motion of the same kind.

It is very easy to obtain this little Fern and to set it growing. We may expect further observations to be made upon it without delay.—
ASA GRAY.

HOW TO MAKE PERMANENT BOTANICAL OBJECTS FOR THE MICROSCOPE.—In the GAZETTE for September, 1879, I had a short paper on staining and double staining of vegetable tissues. I desire now to add a few hints on the previous and the subsequent stages of the preparation.

Mounted objects may be divided into two classes, i.e , the opaque, and the transparent;—the former to be seen by a light (more or less strong) from above, and the latter by light passing through the object from below.

The first thing for the preparer to decide upon, is, which of these two classes shall any object come under?

If the former, the preparation is extremely simple. The whole problem resolves itself into making a suitable case for the treasure. To give a tangible idea suppose we have the seed of a Portulaca or the scarlet tip of a Cladonia, or the yellow apothecium of a Theloschistes. The first thing to do, is to see that your cage (or to speak strictly, your cell) is opaque and of sufficient depth to hold the object. Opticians now keep wooden slides with a central concavity ready to close by placing over it a glass cover. These are cheap and neat.